

to find a single example of the immaculate form flying with the *contigua*.

It is interesting to note that while *contigua* is never found in the east woods (where I take the *militaris*) nor is *militaris* found in the west woods (where I take *contigua*), yet the only *H. lecontei* I have ever taken locally was taken in the west woods flying with the *contigua*.

H. militaris flies from June 10th to 20th, the yellow form (*H. dyarivi*) flying with them, but the *H. contigua* does not appear until about July 10-20th). *H. clymene* appears in the east woods about July 1-10, after *militaris* are gone, but does not appear in the west woods.

The colored boys (Nos. 95-96) were so named from their remarkable resemblance to the human figure, when the wings are folded at rest.

A series of this variable genus, even from one locality, would in a few years' collecting become quite interesting, while if formed by exchange from different localities widely removed, would become intensely so.

A proposed new genus of Odonata (Dragonflies) of the Subfamily Aeschninae, Group Aeschna.

BY E. B. WILLIAMSON, Bluffton, Indiana.

(With plate 11)

CORYPHAESCHNA* n. g.

Upper piece of arculus longer than the lower piece; subcostal vein not prolonged beyond the nodus; male with anal triangle of 2 cells, a distinct anal angle, and auricles on the second abdominal segment; supplementary sector between the lower branch of the subnodal and the median sectors curved widely from the lower branch of the subnodal, 4-8 cells separating them at the widest point, for $\frac{1}{4}$ - $\frac{1}{3}$ its length the sup-

* *Coryphe* Gr. apex; *Aeschna*, a genus of Odonata, "a name introduced by former writers," probably *aischros* Gr. ugly.

plementary sector is parallel to the posterior margin of the wing; subnodal sector forking under the middle of the pterostigma (in hind wings 1 ♂, 1 ♀, *adneva*, Mexico, the forking is at level of inner end of pterostigma), * 2 rows of cells in the fork, 2 or 3, rarely 4 cells at margin; supplementary sector between the principal and nodal sectors originating far beyond pterostigma; submedian and supratrangular spaces cross-veined, the first cross-vein of the submedian space placed proximal to the first antecubital; supplementary sector between the short sector and the upper sector of the triangle apparently originating as the most anterior vein from the outer side of the triangle; inner side of the triangle of the hind wing not half as long as the outer side; median and short sectors converging till beyond the nodus when the short sector apparently merges into the median, the continuation of the short sector to the margin of the wing apparently a branch from the short sector at a point on the short sector 2 cells distant from the point of union of the short and median sectors; this apical portion of the short sector is S-shaped and is separated from the median sector by 2 or 3 cells for the distance of 2 cells, then by 1 cell to the margin; † 1 row of cells throughout or 2 rows in the proximal half of the space between the sectors of the triangle of the hind wing; anal loop of 3 vertical rows of cells and supplemental loop behind it of 2 horizontal rows; ‡

*The upper branch of the fork is a continuation in direction of the subnodal, the lower branch springs from this. I do not understand Karsch's foot-note, p. 288 (see bibliography below), "*Aeschna ingens* Ramb., *A. juncea* (L.), *A. squamata* (Mull.), lassen mehrere feine Aeste des Subnodal-sectors ähnlich dem Verhalten bei *Anax* Leach deutlich erkennen."

† The course of the short sector as found in *Aeschna juncea* undergoes considerable modification in the genus *Aeschna*. In *A. bouariensis* and *A. californica*, for example, a condition approximating *Coryphæschua* is reached, but in the *Aeschnas* the short sector appears forked with the upper branch merging into the median sector, while the lower branch is straighter than in *Coryphæschua*. Also in *Coryphæschua* the median and short sectors are more converging throughout their lengths than is the case in *Aeschna*.

‡ Prof. Needham in 1897 drew up a tentative description of a new genus of Odonata with *ingens* as the type, naming several species of *Aeschna*

abdominal segments 3 and 4 similar in size and shape, in ♂ *adnexa* and ♂ *virens* 3 slightly constricted; superior abdominal appendages long and narrow, longer in the ♀, without teeth or hooks in either sex, and with only low keels. Segment 10 of ♂ without dorsal teeth.

Type.—*Aeschna ingens* Rambur. Insectes Névroptères, p. 192, 1842.

BIBLIOGRAPHY.

I. Edm. de Selys Longchamps.—Synopsis des Aeschnines. Première partie: Classification. Bull. de l'Acad. roy. de Belg. 3^{me} serie, tome V, No. 6; 1883, pp. 711-748.

II. F. Karsch.—Kritik des Systems der Aeschniden. Entomologische Nachrichten. Jahrgang xvii (1891), No. 18, Seite 273-290.

My original MS. describing this genus has undergone considerable modification as the result of notes furnished me by Dr. Calvert who has studied *Aeschna adnexa* and *A. virens*, species not accessible to me which, he writes, belong to *Coryphaeschna*. With these notes as a basis the above characterization of the proposed new genus has been broadened to include the 3 species, *ingens*, *adnexa* and *virens*. Future study of other species will probably necessitate still farther modification in this direction, the tendency being doubtless to include specific characters in a generic definition. Dr. Calvert has also studied 4 ♂ and 3 ♀ of *ingens*, and I am indebted to him for several suggestions embodied in the above description. Of *A. virens* he has studied 9 front wings and 9 hind wings of males, and 8 front wings and 8 hind wings of females; of *adnexa* 7 front wings and 8 hind wings of males, and 7 front wings and 7 hind wings of females.

as members of the proposed new genus. He has kindly placed this MS. in my hands, and to it I am indebted for the above character. In one wing of a ♀ *ingens* from Florida there are 2 vertical rows of cells in the anal loop. The supplemental loop is poorly defined in all the *adnexa* wings studied by Dr. Calvert, and in 1 ♀ of *virens* it consisted of 3 horizontal rows.

SOME VENATIONAL CHARACTERS OF FIVE GENERA OF *ÆSCHININÆ*.

<i>ÆSCHNA</i> .	<i>CORYPHÆSCHNA</i> .	<i>EPIÆSCHNA</i> .	<i>PLANAÆSCHNA</i> .	<i>NASIAÆSCHNA</i> .
Inner side of triangle of hind wing.	More than half as long as outer side.	Not half as long as outer side.	?	About half as long as outer side.
Supplementary sector between the short sector and the upper sector of the triangle.	Origin similar to <i>Æschna</i> . 2 or 3 rows of cells between the supplementary sector and the short sector, 1 cell between at margin. (Five rows of cells between the supplementary sector and the short sector, 1 supp. sector and short sector with 2 cells at margin in some <i>virens</i> .)	Originating apparently 1 row of cells anterior to the line on which it originates in <i>Æschna</i> . 3 rows of cells between the supplementary sector and the short sector, 1 or 2 cells between at margin.	?	Originating as in <i>Epiæschna</i> . 1 row of cells between the supplementary sector and the short sector throughout.
First cross-vein of submedian space.	Before the first antecubital (in <i>rufescens</i> same level in front wing).	After the first antecubital.	?	Like <i>Epiæschna</i> .
Subnodal sector forking	At inner end of or, more usually, before the pterostigma.	Much before the pterostigma.	Midway between nodus and pterostigma.	Much before pterostigma.

	AESCHNA.	CORYPHAESCHNA	EPIAESCHNA.	PLANAESCHNA.	NASIAESCHNA.
Cells between fork of subnodal.	3 rows increasing at margin (in <i>erythro-melas</i> , according to McLachlan's descriptions and in <i>melanictera</i> , according to Dr. Calvert, 2 rows, increasing).	2 rows, 2 or 3, rarely 4, at margin.	3 or 4 rows increasing to 8 or 9 at margin.	?	3 increasing.
Course of the short sector.	Slightly or abruptly diverging from the median beyond the level of the nodus; from this point of divergence 2 rows of cells between the sectors, which may become 1 or may continue as 2 rows to the margin. (See footnote † page 3.)	See description above under <i>Coryphaeschna</i> n. g. also footnote † page 3.	Scarcely separating; 2 rows of cells for short distance then 1 row to the margin.	?	Parallel to the median; 2 rows for short distance, then 1 row at margin and for short distance before 2 rows.
Supplementary sector between the principal and nodal sectors originating	Before, under, or just beyond the pterostigma.	Far beyond the pterostigma.	Under the pterostigma.	?	Under the pterostigma.

	AESCHNA.	CORYPHAESCHNA.	EPIAESCHNA.	PLANAESCHNA.	NASIAESCHNA.
Number of rows of cells between the sectors of the triangle in the hind wing.	2 (1 in <i>rufescens</i>).	1 throughout or 2 rows in the proximal half of the space between the sectors.	1 increasing.	?	1 increasing.
Number of cells in internal triangle.	2 or 1 (species with 1 may not be congeneric.)	1 or 2.	Usually 2 in front wing and 1 in hind wing.	?	1.
First cell of triangle.	Divided or not (species with first cell undivided may not be congeneric).	Very rarely divided	Divided in front wing, rarely divided in hind wing.	?	Rarely divided.
Number of rows of cells between the lower branch of the subnodal and the supplementary sector below it.	3 to 6.	4 to 8, usually 5 in <i>ingens</i> ; usually 6 in <i>virens</i> ; usually 4 in <i>adnexa</i> .	2, rarely 1.	1.	1.

The above study is based on the following material: *Aeschna grandis* ♀; *A. juncea* ♀; *A. cyanea* ♂, 2 ♀; *A. constricta* 2 ♂, ♀; *A. clepsydra* 2 ♂; *A. verticilis* ♂; *A. rufescens* 3 ♂; *A. mixta* 2 ♂, 2 ♀; *A. californica* ♂; *A. multicolor* 2 ♂, ♀; *A. minuscula* McLachlan's description; *A. subpupillata* McLachlan's description; *A. diffinis* ♂; *A. bonariensis*, photo of ♀, one side, by Prof. Needham; *A. erythromelas*, McLachlan's description; *Coryphaeschna ingens* 3 ♂, 2 ♀, *Epiaschna heros* ♂, 4 ♀; *Planaschna milnei* McLachlan's and Selys's descriptions; *Nasiaeschna pentacantha* ♀.

Coryphaeschna ingens (Rambur).

Abdomen: ♂ 68-71, ♀ 76-78. Hind wing: ♂ 55-56, ♀ 58. Thorax green, marked with brown. Abdomen black or brown, marked with green or yellowish green; segments 3-8 each with 3 narrow rings of color, the basal ring largely concealed by the apex of the preceding segment, the median ring anterior to the middle of the segment, and the apical ring separated from the extreme apex by a black ring; on the sides the basal ring is produced posteriorly, the other two anteriorly; mid-dorsal abdominal carina narrowly yellow (or green?), with numerous small black teeth, the yellow darker or black at the median transverse ring of green. Auricles in 2 in the male inconspicuous by reason of size and color, green, the margin and the 3 or 4 teeth dark reddish brown or black; sternum of 10 in the female not greatly developed, truncated, with about 50 subequal teeth. Superior appendages about 1.5 mm. wide, and about 7.5 mm. long in the male and 12 mm. long in the female. Supra-triangular space with 3 or 4 cross-veins; post costa in front wing slightly angled at the internal triangle, straight in the hind wing; submedian area in front wing with 4 to 6, in hind wing with 3 to 4, cross-veins, including the inner side of the internal triangle; antecubitals: frontwing, 18-22; hind wing, 13-17; postcubitals: front wing, 9-12; hind wing, 12-13; in the front wing the external point of the triangle is between the fifth and eighth cross-veins between the median and short sectors, in the hind wing between the fourth and sixth; 2 cells in the anal triangle of the male; length of pterostigma, 5 mm.; number of cells under pterostigma; front wing, 3 to 4; hind wing, 3 to 4.*

Distribution.—Georgia, Florida and Cuba. I have studied specimens from Florida collected in March and April by Mr. W. S. Blatchley, and Hubbard and Schwartz.

Synopsis of Three Species of Coryphaeschna. †

By Philip P. Calvert.

C. ingens Rambur.

Dorsum of thorax predominantly reddish-brown, a green antehumeral stripe (which at its upper end may be confluent with a short green stripe which divides the upper half of the brown humeral stripe lengthwise),

* In such a short article as the above I have deemed it desirable at the present time to use the older and more familiar wing terminology rather than the preferable system proposed by Comstock and Needham.

† It must not be inferred, either from this synopsis or from the notes which I have furnished Mr. Williamson, that I assume any responsibility for the erection of this new genus. I have not made any researches to determine whether the separation of *Coryphaeschna* be justified or not.—P. P. C.

which is nearly as wide as the brown humeral stripe. Sides of thorax green, a reddish brown band occupying nearly all of the metepisternum, and the anterior edge of the metepimeron, or merely forming a rather wide stripe on both sides of the second lateral suture. Tip of the vertex pale green, face bright green: the superior, curved, transverse groove of the anterior surface of the frons not filled with dark brown or black. Male with the third abdominal segment but very faintly constricted, the inferior appendage reaching to one-half the length of the superiors. Female with the four blackish spots on abd. seg. 2 transversely elongated, and the abdominal appendages extremely long. Abdomen (excl. apps.*) ♂ 58-61, ♀ 65; sup. apps. ♂ 7-7.75, ♀ 14; width of head ♂ 10.5-11.5, ♀ 11; hind wing ♂ 56-59, ♀ 58-60; pterostigma of front wings ♂ ♀ 6 mm.

Hab.—Georgia, Florida, Cuba. I have studied only Floridan examples.

C. virens Rambur.

Dorsum of thorax in life bright green, a line on each side of the median carina and a short, oblique, almost transverse, antehumeral line, brown. Sides of thorax green, brown confined to lines on the humeral and second lateral sutures. Tip of vertex pale green, face bright green; the superior, curved, transverse groove on the anterior surface of the frons not filled with black or dark brown (except in one Cuban ♀ which otherwise agrees with typical *virens*). Male with the third abdominal segment slightly constricted, the inferior appendage reaching to about three-fifths of the length of the superiors. Female with the four blackish spots on abd. seg. 2 nearly square, and the abdominal appendages moderately long. Abdomen (excl. app.) ♂ 50-57, ♀ 51-64; sup. apps. ♂ 5-6.5, ♀ 7 (?); width of head ♂ ♀ 10-11; hind wings ♂ 50-56, ♀ 51-60; pterostigma of front wings ♂ ♀ 4.5-5.5.

Hab.—Georgia (?), Cuba, Isle of Pines, Hayti, Trinidad, Mexico, Panama, Venezuela, Amazons, Bolivia. I have seen material from seven of these localities, details for which and for *adnexa* will be given in the *Biologia Centrali-Americana*.

C. adnexa Hagen.

Thorax as described above for *virens*. Tip of vertex blackish (green in two Mexican females), face bright blue (♂) or green (♀), the black T-spot of the frons extending on the anterior surface and filling up the superior, curved, transverse groove thereon (except in the Mexican examples). Male with the third abdominal segment slightly constricted, the inferior appendage reaching to one-third the length of the superiors.

* Contrary to my usual custom, I give the length of the abdomen for these species exclusive of the appendages, since the latter are so frequently broken off in the *Aeschninæ*.—P. P. C.

Female with the abdominal appendages moderately long. Abdomen (excl. apps.) ♂ 45.46, ♀ 47.48; sup. apps. ♂ 6.6.5, ♀ 7.5; width of head ♂ ♀ 8.5.9; hind wing ♂ 41.5-43, ♀ 42-43; pterostigma of front wings ♂ 3.7-4, ♀ 4.

Hab.—Cuba, Hayti, Mexico, Honduras, Amazons. All these localities are represented in the material I have seen.

EXPLANATION OF PLATE II.

Front and hind wings, from photographs (Williamson), of

1. *Aeschna juncea* Linn. ♀ x 1½.
2. *Coryphæschna ingens* Ramb. ♂ x 2
3. *Epiæschna heros* Fab. ♀ x 2.

Three Undescribed Lepidoptera from Southern California.

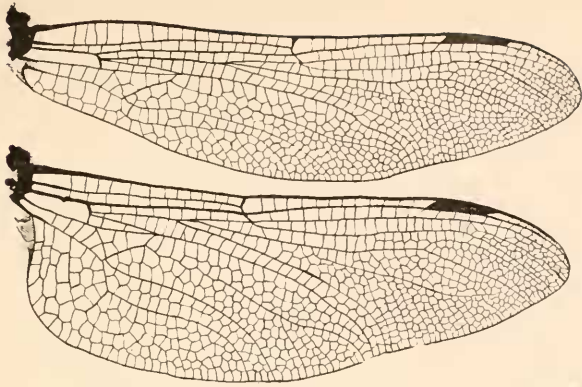
BY FORDYCE GRINNELL, JR., Palo Alto, Cal.

Thecla spadix Henry Edwards.—♂.—Expands $1\frac{1}{8}$ to $1\frac{5}{8}$ inches. Upper side, primaries, olive merging into hair brown towards the inner margin. Darkest towards the apex. Secondaries entire olive except the inner margin, which is drab. Underside fawn color on both wings. The primaries have a very faint line of dashes parallel to the outer margin, and a very faint discal spot. On the secondaries a comparatively large discal spot. An irregular row of dashes parallel to the outer margin, continuous with those of the primaries and about two-thirds of the distance from the inner margin. In the region of the median nervules close to the outer margin, there is a black crescent and dot enclosing a red spot. In the anal angle there is a black field overlaid with blue scales and a white spot between two black dots. Tails short, terminated with white. Body same color as the wings, but covered with quite long white hairs. Antennæ ringed with alternate white and black rings. Fringes white.

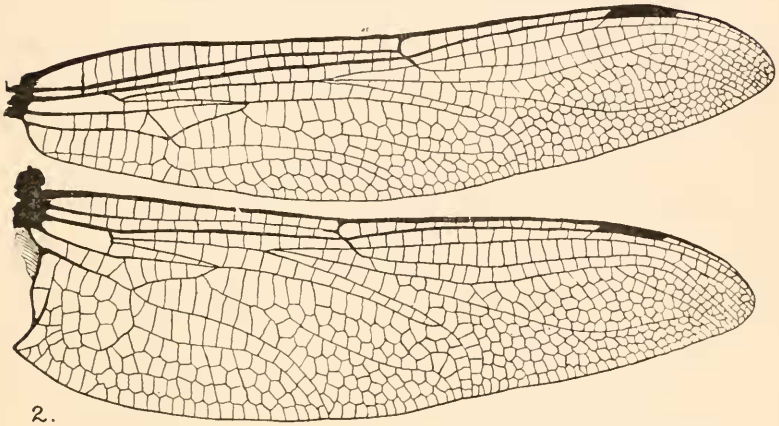
Habitat.—Mountains of Southern California.

Types 2 ♂, collection California Academy of Sciences, taken by the writer on Mt. Wilson, Sierra Madre Mountains, near Pasadena. Mr. J. Elmer Brown took specimens on Mt. Lowe in the same range of mountains.

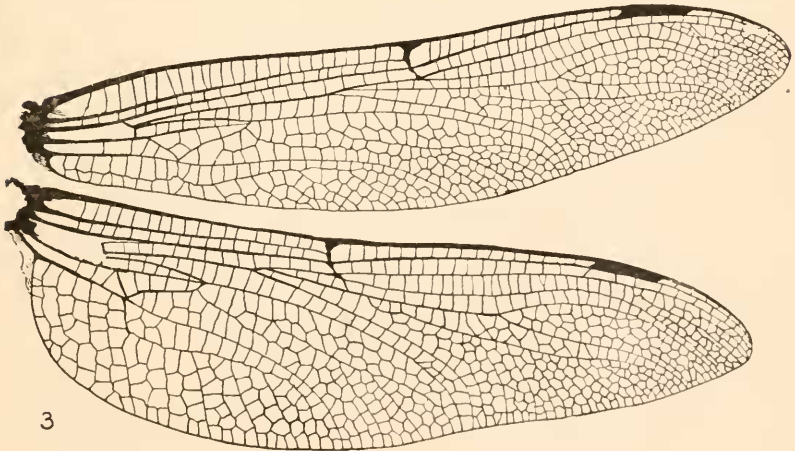
I took most of my specimens on June 25 on Mt. Wilson, flying around the clumps of chaparral along the trail. It is the swiftest and most wary *Thecla* that I have had any experience with. A colony is usually found gyrating around some favorite shrub. After they become settled on a twig, it is



1.



2.



3

1. *ÆSCHNA JUNCEA*—(LINN) ♀. 2. *CORYPHÆSCHNA INGENS*—(RAMB.) ♂.
3. *EPIÆSCHNA HEROS*—(FAB.) ♀.

William - 1903. : 1-10